Entity-Relationship Diagrams

CSC 4480

Basic Symbols

- A box represents a table.
- An arrow represents a FK pointing back to the table where it appears as a PK.

Interpreting the Diagram

- The model specifies a faculty table.
- The model specifies a course table.
- Each course is associated with only one faculty.
- Each faculty member can be associated with many courses.

Terminology

- **Entity Classes**: categories of things of interest to the business; represented by boxes; implemented as tables.
- **Attributes**: columns of the entity tables; often not shown on diagram.
- **Relationships**: represented by lines with crow's feet. Implemented with FKS.

Entity Class Naming

- Entity class names are singular.
  - customer, not customers.
- Why? Consistency
- Note: some people use plurals; for example, Ruby on Rails.
- Either way, be consistent.

Entity Class Definitions

- Entity class names must be supported by definitions.
- Example:
  - “FacultyMember” is for full-time and adjunct faculty members.
  - Oh, I used FacultyMember for a grad student teaching a lab section.
Relationships

- The convention describes the meaning, cardinality, and optionality of relationships.
- Naming the relationship is important.
- Example:
  - For the relationship between FacultyMember and Course: does the faculty member teach the course, or manage the course?

Many-to-Many Relationships

- A relational database cannot directly implement many-to-many relationships using FKs.
- We can implement it using a table.
- The “one” end is always mandatory.

One-to-One Relationships

- Infrequent. Be sure you have it right.

Self-Referencing Relationships

- Each employee may manage one or more employees.
- Each employee may be managed by one employee.
- A course may be a prerequisite for many courses.
- A course may have many prerequisites.

Relationship Names

- Consider Country and Currency.
- one-to-many? many-to-many?
- It depends. Is the relationship that:
  - the currency is issued by the country
  - the currency is legal tender in the country
- If the former, what about the euro?